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Modeling of propagation of EM ELF waves on the surface of Mars using FDTD method in the context of ground tomography

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The presentation will show selected results of modeling the propagation of ELF (extremely low frequencies) electromagnetic waves generated by sandstorms on the surface of Mars. On Mars the properties of the subsurface cannot be neglected. The parameters of the waveguide change significantly with non-conducting ground, which affects the propagation of ELF waves.

Having a sufficiently wide base of solutions, we can use the method of reverse solutions to recreate the parameters of the waveguide, and thus the electrical parameters of the substrate. This opens up new possibilities for ground tomography using ELF waves measurements on the surface of Mars. This method requires the existence of natural radiation sources on Mars such as Dust storms. The results will allow for the interpellation of the results of measurements of real Martian ELF stations, the important details of which were included in the modeling.

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